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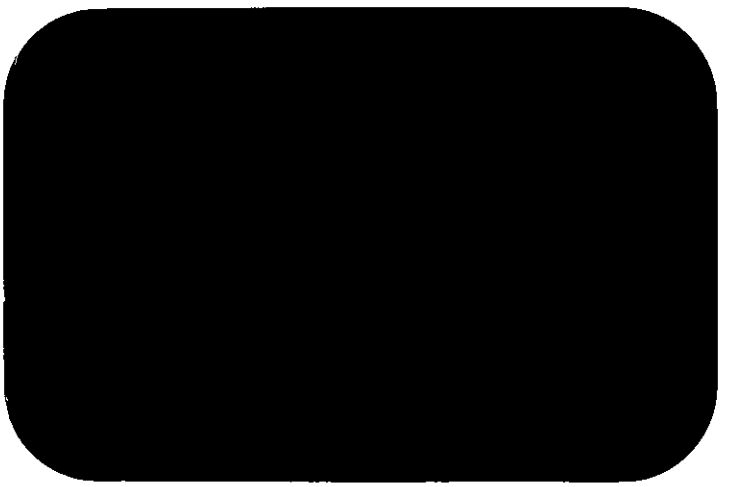
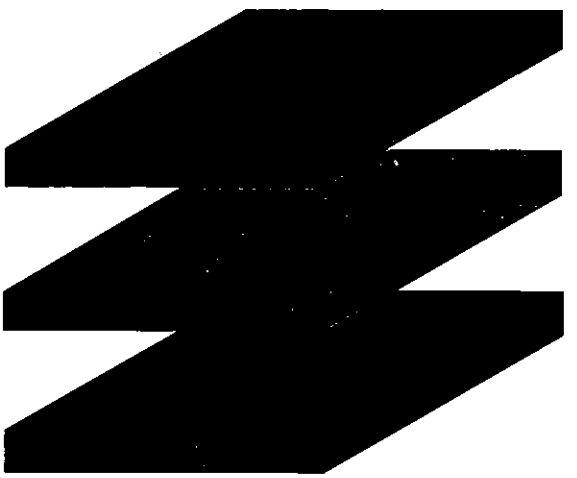
T.R. Edgerton, Inc.

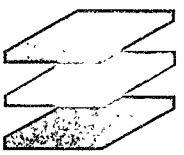




Ground-water Sampling
Chemical Process Division

Prepared for:
Worth Chemical Corporation
Chemical Process Division
Charlotte, NC

Prepared by:
T. R. Edgerton, Inc.
Cary, NC



102 Woodwinds Industrial Court
Suite F
Cary, North Carolina 27511
919/469-9795

T.R. Edgerton, Inc.
Environmental
Consultants

March 14, 1988

Mr. Jack Bower
Chemical Process Division
Worth Chemical Corporation
11750 Fruehauf Drive
Charlotte, NC 28210

Re: Ground-water Sampling, Worth Chemical Corp.
Chemical Process Division, Charlotte, NC
TREI Job # 1072-088-001

Dear Mr. Bower:

T. R. Edgerton, Inc. is pleased to submit this report covering the sampling and testing of ground-water monitor wells located at Worth Chemical Corp., Chemical Process Division, Charlotte, NC.

BACKGROUND

Per request of Dr. Eric Klingel, North Carolina Department of National Resources and Community Development, Division of Environmental Management, Mooresville Regional office, sampling was conducted on monitor wells located at Worth Chemical Corp., Chemical Process Division, Charlotte, NC. This sampling was conducted as a result of the findings presented in (1) Environmental Sub-Surface Investigation, Annandale Corp. Site, February 25, 1987; and (2) Addendum Environmental Sub-Surface Investigation, Annandale Corp. Site, March 27, 1987.

A meeting was held on August 11, 1987 to discuss the two afore-mentioned reports. A summary of this meeting is attached. Per phone conversation of January 27, 1988 with Dr. Klingel, sampling was to be conducted at the Worth Chemical Corp., Charlotte, NC facility for phenols and lead both filtered and un-filtered and split sampled conducted with the Division of Environmental Management staff.

OBJECTIVES

The objectives of the ground-water sampling were to determine if contaminants identified in previous sampling events were naturally occurring and/or above ground-water quality standards as defined in NC Title 15 Subchapter 2L Section .0202.

Ground-water Monitor Well Sampling

Ground-water monitor well sampling was conducted on 2/23/88. Sampling procedures and monitor well evacuation and development followed procedures found in (1) "Manual of Ground-Water Quality Sampling Procedures" USEPA, 1981; (2) "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document", USEPA, September, 1986; (3) Guidance Document - August 22, 1985 N.C. Office Solid and Hazardous Waste "An Approved RCRA Ground-Water Sampling and Analysis Plan".

Briefly, 3-5 well volumes were removed from each well before sampling, using a dedicated teflon bailer. Samples were collected without filtering for phenol and lead. Samples were also collected at the same time by Division of Environmental Management Personnel Messrs. Jesse Wells and Tony Parker. Samples were then collected for field filtration before placement in sample bottles for phenol and lead

analysis. Additionally, samples were collected for the field measurements of pH and conductivity.

Chain-of-custody was adhered to throughout sampling and testing procedures. Copies of the chain-of-custody are found in the attachment section.

Chemical Testing

Inorganic parameters (lead, phenol) followed methods found in "Methods for Chemical Analysis of Water and Waste" EPA 60014-79-020.

CHEMICAL TESTING RESULTS

Lead was determined to be below detection limits of 5 ug/l (ppb) for both filtered and un-filtered samples for all wells. Phenol was below detection limits of 5 ug/l in well AB-1 and AB-3 and detected at 5 ug/l in AB-2 unfiltered and 6 ug/l in AB-2 filtered. A copy of the test results are found in the attachment section.

DISCUSSION OF RESULTS

Ground-water level readings are found in Table 1. Readings compare with those reported in the February 25, 1987 report. From this data, it appears that the ground-water beneath the site is still flowing in a north to northeasterly direction. Figure 1 is a ground-water contour map for 2/22/88. Figure 2 is a copy for the 2/13/87 figures for ground-water directional flow taken from the 2/25/87 report.

Conductivity readings and pH are found in Table 2. Conductivity appears to increase across the site.

Chemical testing indicates the absence of lead and phenol in all wells. The low level of phenol detected in monitor well AB-2 can be attributed to analytical error.

RECOMMENDATIONS

T. R. Edgerton, Inc. recommends that Worth Chemical Corp. request from the North Carolina Department of National Resources and Community Development, Division of Environmental Management, Mooresville Regional Office permission to close out the site and abandon the monitor wells according to North Carolina Regulations Title 15 Subchapter 2C Section .0214. These procedures are attached for your information.

If you have any questions concerning this request or need additional assistance, please don't hesitate to contact us.

Very truly yours,

T. R. EDGERTON, INC.

Thomas R. Edgerton, FAIC, CPC
Sr. Consultant

Brent Chambers, Geologist
Manager, Geo-Sciences Department

Attachments

102 Woodwinds Industrial Court
Suite F
Cary, North Carolina 27511
919/469-9795

T.R. Edgerton, Inc.
Environmental
Consultants

August 12, 1987

Mr. Cal Lynch
Vice-President, Finance
Worth Chemical Corp.
P.O. Box 20725
Greensboro, NC 27420

Re: Meeting with State of North Carolina,
Chemical Products Division, Charlotte, NC
TREI Job No. 1072-087-001

Dear Mr. Lynch:

A meeting was held at Worth Chemical Corporation, Chemical Products Division, Charlotte, North Carolina on Tuesday, August 11, 1987, to discuss the findings of the site assessment of the Chemical Products Division site submitted to the State of North Carolina on April 1, 1987. The meeting was attended by Eric Klingel, Ph.D., Groundwater Regional Supervisor, North Carolina Dept. of Natural Resources and Community Development, Jack Bower, Worth Chemical Corp., Chemical Products Division, Ray Wilson, Operations Manager, Worth Chemical Corp., Greensboro, NC and Messers Tom Edgerton and Brent Chambers of T. R. Edgerton, Inc. (TREI) Cary, NC.

To summarize, Dr. Klingel agreed with Worth and TREI personnel that the contaminated groundwater (heavy metals, phenol) at the Chemical Products Division (CPD) site may be a result of naturally occurring constituents. Dr. Klingel concurred with our recommendations for an additional monitor well sampling event to help determine the source of contamination.

The State of North Carolina requested to be allowed to co-sample with TREI at the aforementioned sampling event. Testing will be conducted on a filtered and unfiltered portion of the ground-water sample to help determine the influence of naturally occurring

constituents on the groundwater at the CPD site. Additionally, TREI will be taking a sample of bedrock for X-ray fluorescence analysis. This test will help to determine the constituents (heavy metals) naturally occurring on this site.

Additionally, Dr. Klingel felt that the site, if testing so indicated, should not be further investigated and essentially noted as a site with high concentration of naturally occurring constituents. However, if testing indicates a potential source other than naturally occurring for ground-water contamination, than further investigations may be warranted.

In summary, the meeting was very beneficial and it appears that the State of North Carolina is being extremely cooperative on this site.

If you have any questions, please give us a call.

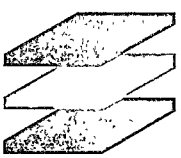
Very truly yours,
T. R. EDGERTON, INC.

Thomas R. Edgerton, FAIC, CPC
Senior Consultant

Brent Chambers
Project Manager/Geologist

cc: Jack Bower, Worth Chemical CPD
Ray Wilson, Worth Chemical, Greensboro

Well Abandonment Procedures



(h) Reporting. The owner or operator shall be responsible for submitting to the director on forms furnished by the director, or in an alternate approved form:

(1) A record of the construction or abandonment to include: the owner's name; well location, size, and depth; casing record; method of completion or abandonment; formation log; static water level; injection apparatus; and records of any surveys, geophysical logs, tests, or water analyses. These records shall be submitted within 30 days of completion or abandonment.

(2) A record of any well repair to include: the owner's name; the well location, and the change in construction and materials replaced. This record shall be submitted within 30 days of repair.

(3) Monthly reports on required monitoring activities, which shall include:

(A) the date, exact place, and time of sampling or measurements;

(B) the individual(s) who performed the sampling or measurements;

(C) the date(s) analyses are performed;

(D) the individual(s) who performed the analyses;

(E) the analytical techniques or methods used; and

(F) the results of such sampling, measurements or analyses.

History Note: Statutory Authority G.S. 87-87; 87-88; 87-94; 87-95; 143-211; 143-214.2(b); 143-215.3(a)(1); 143-215.3(c); 143-215.6(c);
Eff. August 1, 1982;
Amended Eff. March 1, 1984.

.0214 ABANDONMENT

(a) Any injection and/or associated monitor well which has been abandoned, either temporarily or permanently, shall be abandoned in accordance with one of the following procedures or other alternatives as specified by the director:

(1) Procedures for temporarily abandoned wells.

(A) Upon temporary removal from service, or prior to being put into service, the well shall be sealed with a water-tight cap or seal.

(B) The well shall be maintained whereby it is not a source or channel of contamination to an underground source of drinking water during its temporary status.

(C) The well shall be repaired or permanently abandoned, as specified by the director, within 30

days of receipt of notice from the department, upon finding that a well is acting as a source or channel of contamination to an underground source of drinking water.

(2) Procedures for permanently abandoned wells.

(A) All casing and materials may be removed prior to initiation of abandonment procedures if the director finds such removal will not be responsible for, or contribute to, the contamination of an underground source of drinking water.

(B) The entire depth of the well shall be sounded before it is sealed to insure freedom from obstructions that may interfere with sealing operations.

(C) The well shall be thoroughly chlorinated, prior to sealing, if the director determines that failure to do so could lead to the contamination of an underground source of drinking water.

(D) The well shall be completely filled with cement grout, which shall be introduced into the well through a pipe which extends to the bottom of the well and is raised as the well is filled.

(E) In the case of gravel-packed wells in which the casing and screens have not been removed, the casing shall be perforated opposite the gravel pack, at intervals not exceeding 10 feet, and grout injected through the perforations.

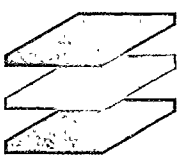
(F) In those cases when, as a result of the injection operations, a subsurface cavity has been created, the well shall be abandoned in such a manner that will prevent the movement of fluids into or between underground sources of drinking water and in accordance with the terms and conditions of the permit.

(b) Exploratory and/or test wells, constructed for the purposes of obtaining information regarding an injection well site, shall be permanently abandoned upon completion of their exploratory or testing status.

(c) An injection well shall be permanently abandoned by the drilling contractor before removing his equipment from the site if, for any reason prior to injection, the casing has not been installed or has been removed from the well bore.

History Note: Statutory Authority G.S. 87-87; 87-88; 143-211; 143-215.3(a)(1); 143-215.3(c);
Eff. August 1, 1982.

Chemical Test Results



RECEIVED MAR 1 0 1988

iea Industrial & Environmental Analysts, Inc.
P.O. Box 12846 • Research Triangle Park, NC 27709 • 919-467-9919

Date: March 3, 1988

Ms. Sharon Mayer
T.R. Edgerton Inc.
102 F Woodwinds Ind. Ct.
Cary, NC 27511

Reference: IEA Report No. 308012
Project I.D.# 1052-G87-004

Dear Ms. Mayer,

Transmitted herewith are the results of analyses on six samples submitted to our laboratory on February 25, 1988.
Please see the enclosed reports for your results.

Very truly yours,

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.

Mark D. Randall

Mark Randall
Senior Chemist

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IEA LAB RESULTS

IEA# 308012 Samples: 6 Total Parameters: 12

Client Name T.R. Edgerton Inc.

Sa#	Sample I.D.	Parameter Studied	Results	Date Analyzed	Comments
1	AB-1 Filt	Lead	<0.005 mg/L	2/29/88	
2	AB-1 UnFilt	Lead	<0.005 mg/L	2/29/88	
3	AB-2 UnFilt	Lead	<0.005 mg/L	2/29/88	
4	AB-2 Filt	Lead	<0.005 mg/L	2/29/88	
5	AB-3 Filt	Lead	<0.005 mg/L	2/29/88	
6	AB-3 UnFilt	Lead	<0.005 mg/L	2/29/88	
1	AB-1 Filt	Total Phenols	<0.005 mg/L	3/1/88	
2	AB-1 UnFilt	Total Phenols	<0.005 mg/L	3/1/88	
3	AB-2 UnFilt	Total Phenols	0.005 mg/L	3/1/88	
4	AB-2 Filt	Total Phenols	0.006 mg/L	3/1/88	
5	AB-3 Filt	Total Phenols	<0.005 mg/L	3/1/88	
6	AB-3 UnFilt	Total Phenols	<0.005 mg/L	3/1/88	

T.R. Edgerton, Inc.

102 F Woodwinds
Industrial Court
Cary, NC 27511

COPY

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
1052-G87 noll	T R Edgerton

SAMPLERS: *(Signature)* Barry Searles for Tom Edgerton

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Phenols Filtered	Phenols Unfiltered	Lead	[illegible]			REMARKS Normal Turnaround
AB-1	2/23/88	9:42a		✓		4	/	/	/	/			
AB-2	2/23/88	10:10a		✓		4	/	/	/	/			
AB-3	2/23/88	10:35a		✓		4	/	/	/	/			

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
Barry Searles	2/24/88 [illegible]	[illegible signature]	[illegible]	NORMAL TURNAROUND 10-DAY

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

RECEIVED MAR 10 1988

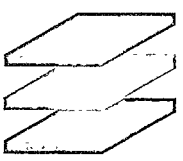
Tables

Table 1
Water Level Readings

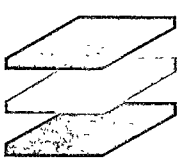
Date	AB-1 Read	AB-1 Elevation	AB-1 MSL	AB-2 Read	AB-2 Elevation	AB-2 MSL	AB-3 Read	AB-3 Elevation	AB-3 MSL
2-22-88	10.13	607.45	597.32	2.83	607.59	604.76	6.03	599.83	593.80

Table 2. Conductivity and pH
Chemical Process Division
Worth Chemical Corp.

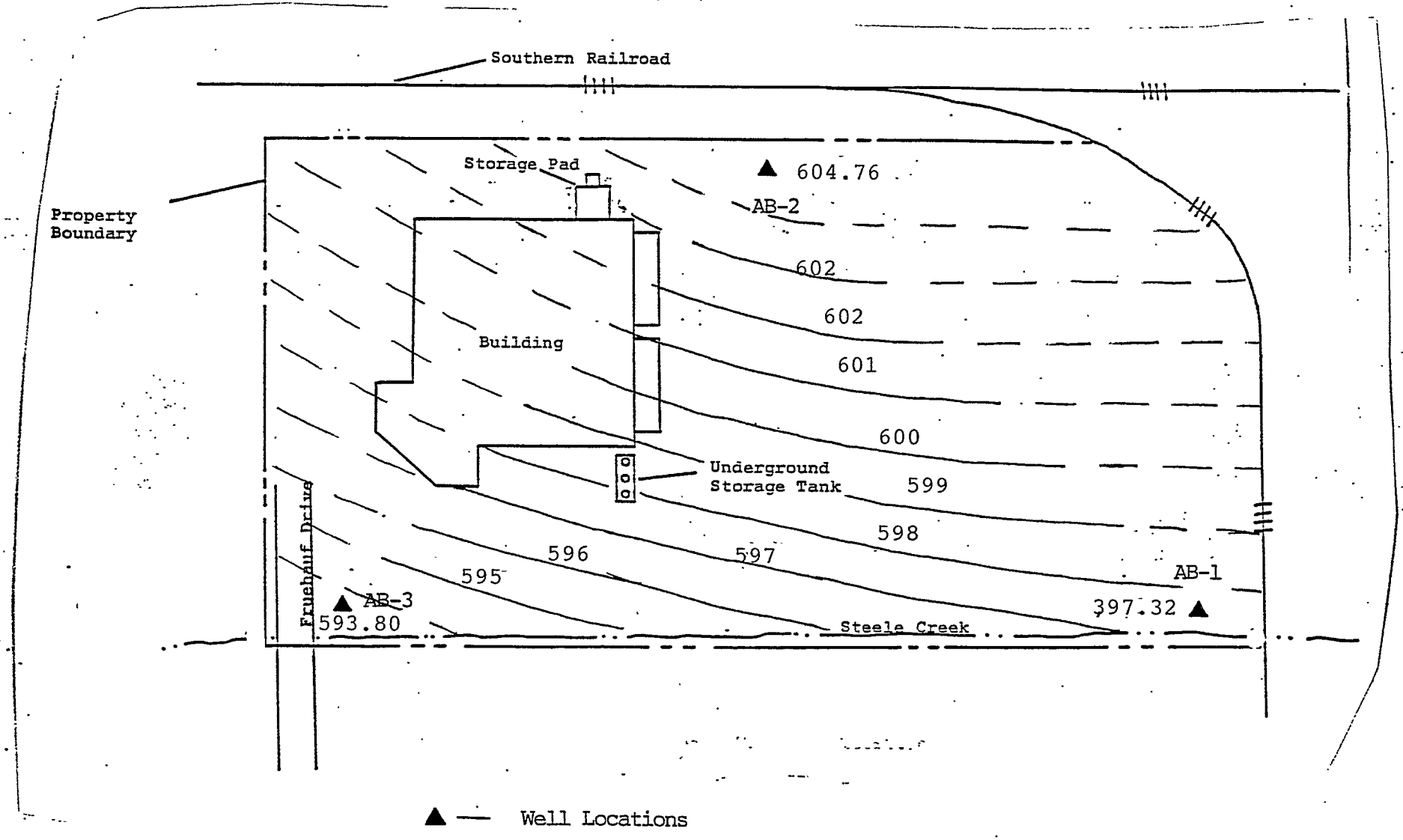
Well No.	Conductivity umhos	pH units
AB-1	575	6.60
AB-2	250	6.90
AB-2	1000	6.75



Figures



Ground-water Contour Map
for 2/22/88



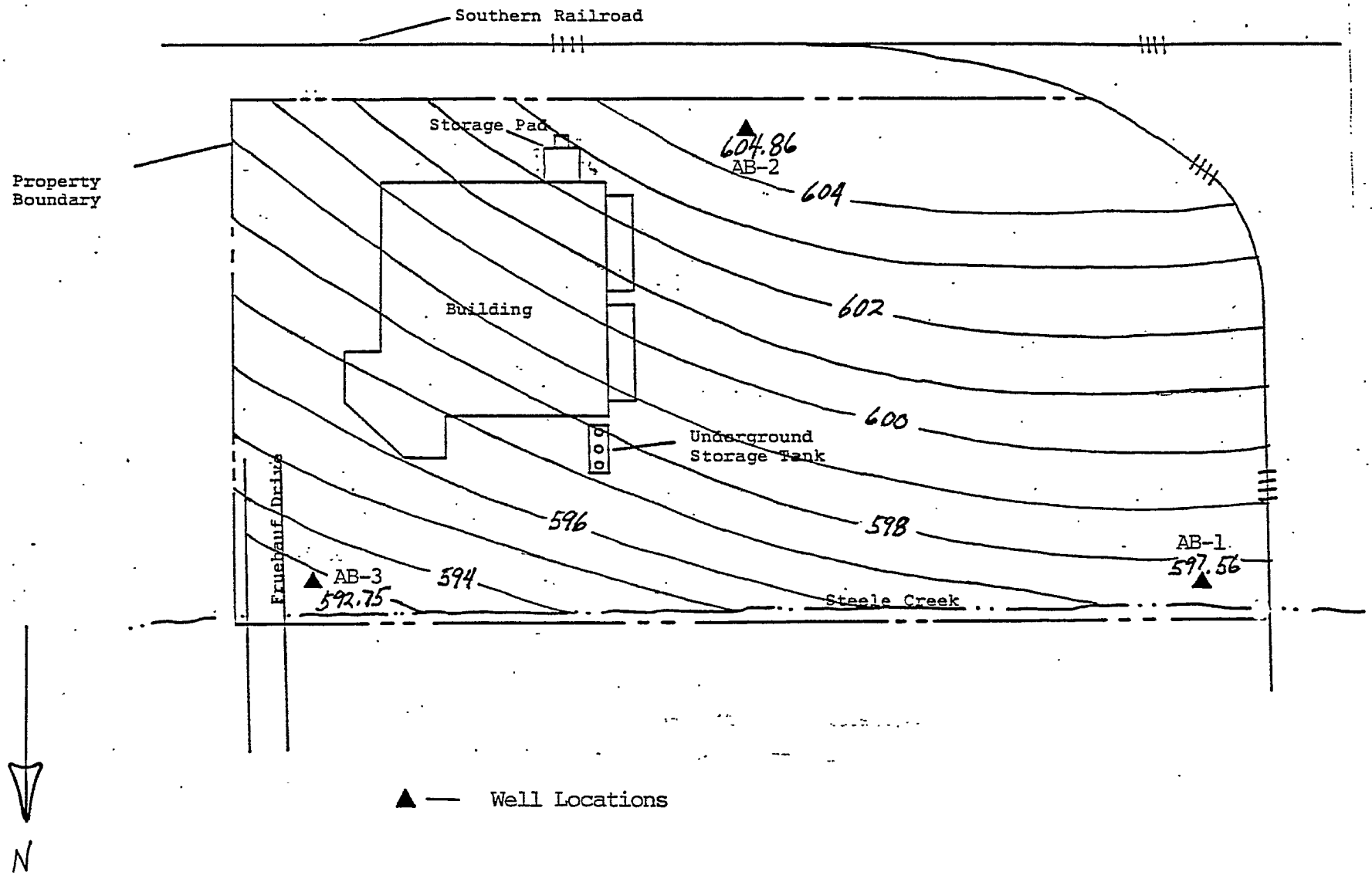
Worth Chemical Corporation
Charlotte, North Carolina

TREI
ENVIRONMENTAL CONSULTANTS

Scale: Not

Job No.1072-001

Groundwater Contour Map
for 2-13-87



Annandale Corporation Charlotte, North Carolina	TREI ENVIRONMENTAL CONSULTANTS	Scale: Not To Job No. 1052-003 Fig. No. 2